Need Analysis of Audio-Visual Media Development to Teach Digestive System for Elementary School

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SUMMARY

The purpose of this study is to obtain 1) an overview of the current situation of the use of instructional media as a learning source in science teaching process in elementary school in Surakarta, 2) the perception and challenges faced by primary school teachers in Surakarta in delivering of the digestive system subject matter, 3) the formulation of learning media needs to be developed in science teaching on the digestive system materials. This study is conducted to teachers and students in elementary schools around Surakarta in even semester of 2018/2019 academic year aimed to understand their accessibility potential by knowledge, types of media used, and to state their perceptions to adopt media in classroom. The results which are analyzed by using descriptive qualitative approach indicated that 1) the current use of instructional media as a source of teaching in science learning process has not been carried out optimally. There are challenges in the delivery of material, primarily abstract and conceptual materials, 2) the subject of digestive system is challenging since the teacher needs a media to visualize the process and explain it in detail and correctly so that students do not have misconceptions about the process of digestive system, and 3) there is a need for learning media to be developed in learning digestive system material, especially in the form of audiovisual media. This result can be a consideration in developing science learning media for elementary school.

Keywords: Need analysis, media, audiovisual, digestive system

INTRODUCTION

The process is an essential element of learning success. The learning process will be useful if the learning objectives are students' understanding of the concepts achieved. Understanding the concept determines learning success since the concept makes the foundation of primary knowledge for further learning. Understanding the concept of science is one of the crucial goals to learn science. It provides an understanding concepts taught to students are not merely rote but must be clearly understood. Understanding the concept of biology is also one of the learning objectives conveyed by the teacher because the teacher acts as a guide for students during learning to achieve the expected idea (Suhermiati, Indana, & Rahayu, 2015).

Science is a human effort in understanding the universe through proper observations of targets, using structured procedures, and explained with scientific reasoning to get a conclusion. The 2013 curriculum stated that fifth-grade students are expected to master several essential science competencies, one of which is understanding the digestive process. The subject of digestive system and processes contains amount of abstract and conceptual material, (Susantini, Nuur, & Thamrin, 2013), very broad and complex, includes some processes occurred in inner organs, so it is difficult to make direct observations, many foreign terms, and the language and has a high level of complexity understanding (Murni, 2013). Based on the scope of the subject of digestive system, the teacher is required to be able to understand and to convey the conceptual concretely so that students can easily understand, and there is no misconception of concepts.

Learning natural science can be conveyed by bringing everyday problems experienced by students in the classroom. Through the process learning, later students can develop scientific attitudes. The issues learned during the learning process must be able to make students understand the concepts of science learned and pursue students discovering facts and new knowledge out of class. Understanding student concepts will greatly influence learning success. The idea of the humans' digestive system is closely related to everyday life, so students must understand the concepts. However, based on the results of interviews conducted with class teachers in Fifth Grade elementary school in Surakarta, the teacher explains that the teacher only uses student books and the teacher's book as a learning resource. As the only one learning source, the book is used to force the students to read a lot. The teacher also explains that media is very rarely used in the learning process since they are more likely to use the lecturing method and ask students to note. This situation makes science lessons is less of interaction and activities, especially on the humans' digestive system material and other conceptual matters. This condition is also supposed to build students' lack of understanding and low grades achievements.

Some cognitive-perceptual development of fifth-grader children has just developed in aged 11-12 years. Children begin to have a more abstract way of thinking. In this development, the child already has the ability to find solutions

in solving a problem without the real object of the problem and is able to remember information that has previously been stored. Children have good enough memory capacity to be able to sort, organize, and classify a problem at hand. This skill is needed to solve a complex problem. The idea that a problem arises can be solved by several solutions, not just one solution. Enjoy the challenges, do research, find information, and solve a problem with the idea that has been previously owned and explore information from the internet and encyclopedias.

One effort that can be used by teachers is to present a series of processes digestive system more concretely by media. The media will overcome the existence of misconceptions by students since visualizing the concept (Caladine, 2008). The use of instructional media can facilitate students in understanding something abstract to be more concrete (Afidah, 2013) and clarify the presentation of messages and information to facilitate (Dewi & Mukminan, 2016) and improve the process and learning outcomes. The use of instructional media should be a concerning part for the teacher in every teaching and learning process (Dosi & Budingsih, 2019). Therefore, teachers should have an intention and need to learn how to use learning media to effectively achieve learning objectives in the teaching and learning process (Fauzi, 2016), especially for some problematic material to understand or conceptual and abstract as the subject of the digestive system. Especially for science learning, many researchers have tested the use of media in science learning to introduce abstract concepts to early childhood learning. Characteristics of young learners who need visualization will be targeted points. Audiovisual media with the features of the visual and audio combination will help very well toward the mastery of concept (Hotimah & Muhtadi, 2017).

Research Objective

Based on the above background, this research needs to be carried out as a preliminary study in the development of learning media on the subject of the digestive system for fifth graders of elementary school. The formulation of the problem in this study are:

- to what extent the current use of instructional media in the science learning process?
- what are the perception and challenges of audiovisual to teach the digestive system?

METHOD

Research Model

This research is qualitative in nature and limited to the need analysis survey (need assessment) sourced from initial observations in the elementary school. This research used the phenomenological approach to find out the reality in the field related to the implemented learning process.

Data Collecting Tools

The data collection technique in this study uses an instrument of needs analysis for teachers and students in the form of a questionnaire. The questionnaire was designed with questions related to the use of media and perceptions about audiovisual media. The survey consisted of 2 parts. The first part consists of three questions that collect information about the use of media, teacher's knowledge about media, and the types of media used. This part is partly adapted from the need for technology integration by Zhu (2018). The second part measures students' perceptions of the application of learning media in class, which consists of two questions about the acceptance of use media in class and followed by open-ended questions about the reasons for choosing an agreement statement. This part of the questionnaire is partly adapted from the perception of technology by Hanif et al. (2018).

Research Subject

Researchers conducted this survey in three schools in Surakarta that were randomly selected to explore the potential and problems that might arise in the learning process. Each school has different characteristics according to the environment and conditions of the school. Respondents are three principals or curriculum staffs to provide information about the current use and acceptance of media in the curriculum. The six science teachers and 15 fifth grade students who are randomly selected are also included to provide information about the current use and acceptance of media in the learning process.

Data Analysis

Data from questionnaires filled out by respondents will be analyzed descriptively and qualitatively. The completed response sheets were collected, compiled, and statistically analyzed to compute the results using Microsoft Excel. The percentage method was used.

FINDINGS

The Current Use of Instructional Media in Science Learning

The use of Instructional Media

Based on observations made by researchers at the three schools, it found that the learning process in elementary school has not used media in learning. Educators, especially science teachers, sometimes encounter difficulties in the process of delivering learning material using media. The findings are assumed as the source of less interaction and some passive students during the class. The teachers encountered problems due to the absence of media for some of the materials science. The materials require visualization of objects to explain series of biological processes that are not able to be observed directly. The use of pictures in books is insufficient to support this problem. As a result, students do not master the material concepts well. Some abstract and conceptual materials, such as photosynthesis, cell division, and metabolism, need to be visualized. All teacher respondents stated that the subject matter included difficult material since hard to find the visualization. In the delivery, there are also obstacles, the difficulty of understanding students at each stage of digestive organs because the process occurs in inner human organs, so students have trouble understanding and imagining the process. As a result, student misconceptions can occur on the subject of digestive organs, a series of digestive processes, digestive problems, and nutritious foods. As also reported by Murni (2013) those problems can be investigated in several paths below.

Knowledge about learning media.

Teachers' knowledge in media is a dominant factor in the use of media in classroom. The experience will drive the teacher to use media variation to perform better teaching. Illustration of expertise in learning media by teachers can be illustrated through access to technology tools and the type of media used in the diagram below. The chart shows that 97% of 61 teachers have their own electronic devices or at least have access to electronic computing devices. Access to computer equipment also refers to teachers who do not have their computer equipment but can use the computer equipment of the school or the facilities of other family members at home.
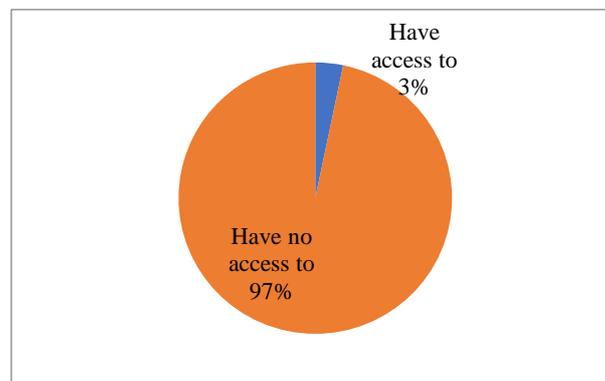
Figure 1. Percentage of access to computer equipment

This depiction indicates that the teacher can be involved in using media if the teachers have intention to apply learning media in the classroom because almost all teachers have sufficient access to computer equipment.

Types of learning media used by teachers.

Furthermore, teachers who have computer devices use various media. However, from those teachers, very few teachers utilize or create audio-visual media as a learning medium. This condition shows that audiovisual media must be considered as the media of choice when designing learning for them because of the potential for adequate audiovisual users in the class. From the results of observations (*Figure 2*), it can be concluded that the use of instructional resources in the form of audiovisual media is still less than optimal utilization, which is very low even though biological material requires more visualization of objects and detailed and more real explanations. All teacher respondents also stated that abstract content needs to be delivered by presenting object visualizations and also showing and explaining biological processes in detail. Therefore, the use of appropriate teaching resources or media needs more attention.
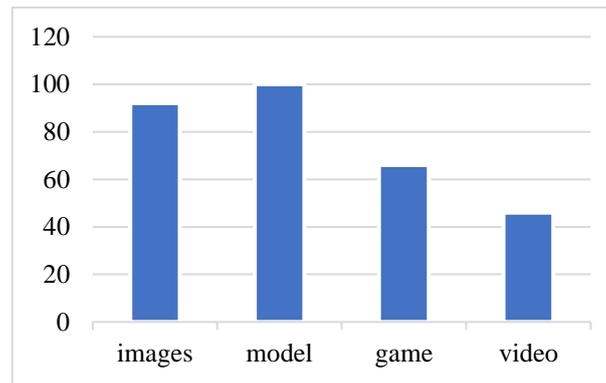
Figure 2. Distribution of types of learning media used

In the diagram above, in general, five types of media have ever been used in science class. Images are a type of media used to explain shapes in two dimensions. This type of media is used by 92% of the total respondents. The second type is model. A model such as torso dolls is used to show three-dimensional shapes in silence. This application has the most significant percentage of users with 100% of total respondents. It means that all teachers have ever used this type. Game and entertainment refer to several games and entertainment-type media for its users. As many as 66% of teachers have ever used this type in their learning. Media video is a combination of audiovisual that are combined to reveal and get information. This type is only used as much as 46% of the total number of teachers actively using instructional media. While 5% of respondents exclusively own other types of media outside the 4 types above. The assumptions of these findings indicate the range of learning media that can be or usually used by the teacher. The teacher will have the convenience of choosing and using variations in the types of media in the classroom which are very varied. It also indicates the less use of video and other audio-visual media. The video is the lowest percentage in use among the other type even though it has the potential to use it as an alternative.

The Perception and Challenges of The Audiovisual Media

Instructional media can not produce success if students do not respond to the media. For this reason, students should be invited to make use of all their senses, and the teacher tries to display stimuli that can be processed with various senses (Hanif, Asrowi, & Sunardi, 2018). The more sensory devices used to receive and process information, the more likely the information is understood and can be retained in memory. Audio-Visual Media means audible and visible media that can be heard and seen. Audio visual-based media can help students understand and comprehend the material being studied (Rozie, 2014). The objects and events which become the material teaching can be visualized realistically to resemble the real situation. Audio messages in learning are needed to focus student attention, so a lesson that has audio and visual dimensions will give the message given be stronger since combining the two delivery systems.

Audiovisual media acceptance

The second part of the questionnaire was used to collect data on students' perceptions of audiovisual media. The first part of this perception describes the level of student acceptance of the audiovisual learning media system in teaching and learning activities.
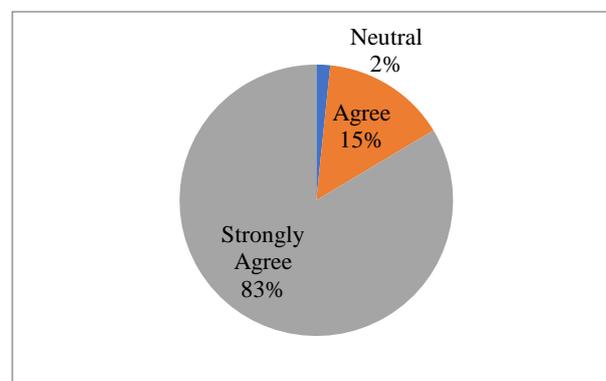

Figure 3. Percentage of the student in agreement

The level of student acceptance of audio-visual media is represented by the statement " Strongly agree " and " Agree ", while rejections are represented " Strongly Disagree 'and' Disagree.' For this section, all participants stated their position to choose to agree or disagree and followed by their reasons. The results show that all students prefer to accept (agree) to use audio-visual media in class. The picture above shows that almost all students agree to apply audiovisual in science class. It indicated that they would accept the use of audiovisual media well in classroom learning. Only 2% of all students answered neutrally while 15% of students agreed, and 83% strongly agreed.

The highest number of students who strongly agreed to use audio-visual media in learning, namely 83%, also proved the active encouragement of students to actively contribute to the learning process when later using audio-visual aids. Subsequent analysis will only focus on the level of acceptance because no student does not agree to apply audiovisual media in their class.

Teaching and learning resources
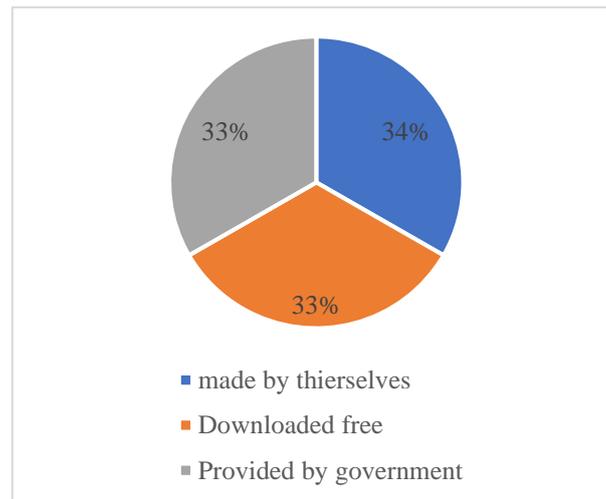
Figure 4. Top 3 teaching and learning resources used

In reality, as many as 66.7% of teachers did not create their own teaching resources but obtained from the internet or only used books from publishers. The observations also found that 100% of students are more interested in learning by using a variety of media. Students prefer to learn with media that shows how to work, pictures or material in more detail and realistic than learning by only using textbooks, modules, or textbooks. Learning resources obtained from the internet, if not sorted correctly, can cause students' misconceptions of the material being taught. Teaching sources from publishers are also considered to be less varied and cannot be used as a complete source of reference in the delivery of material. To apply and choose the appropriate didactic technic, teachers are also expected to expand the use of material. They are supposed to not only download and use it but also compile, develop and even create the learning resources by their selves.

The characteristics of the material being provided by the government are brief and general since it will be used in all regions in the country. The teacher should selectively choose and combine with the local and basic knowledge of the students. Science will close to the learners when it uses the geographical approach. The materials downloaded for free from the Internet also have their challenges. It should be select carefully since sometimes created by a non-educational background person and addressed for non-educational use.

The fact that only one-third of the teachers make their own material in the place where the study was conducted explains that there is an intention to develop the learning resource independently. The teacher has tried to make their own media or teaching resources, but in making them face obstacles such as in making it difficult to develop more detail, inadequate facilities, and require more accuracy and patience. As a result, the media or teaching resources used by the teacher cannot function optimally by students and still lack understanding of the material being taught. The teacher is assumed to have a lack of motivation to make their own material and prefer to download without any development.

CONCLUSION AND DISCUSSION

Discussion

Affordability rate and high enough access to technology will facilitate subsequent teachers implement audiovisual media in learning. On a smaller scale, schools or class, it is also essential to consider the number of teachers who

do not have access to technology. School authorities need to deepen how the number of minorities who do not have access to computer technology will still be able to make the learning process using audio-visual media.

The material of the digestive system in humans is the material that is in theme 3 of the fifth-grade elementary school science material. This material is considered by students and teachers to be quite tricky because it is abstract and requires a lot of media such as pictures and videos, especially in the digestion process in humans, students need a media, so students understand more about the digestive process. The media or learning resource that is used so far is only teacher and student books. The use of this book alone is less able to facilitate students; especially, teachers have not used the media to support the learning process. That is assumed as the cause of less interaction and understanding of the concept of the digestive system in humans and eventually causes not optimal learning achievements. Learning science must provide an opportunity to think logically by gathering facts found with their potential to form a conscientious and critical personality. The use of appropriate didactic technic combined with interactive media will helpful

Explaining the digestive organs and their functions in humans as well as how to maintain the health of the human digestive organs was studied in fifth grade in the odd semester on theme 3. Students in this level will face Digestive System in Humans, Order and Arrangement of Digestive Organs in Humans, Disorders or Diseases in Human Digestives and Nutritious Foods for Health. All of those materials are full of abstract concepts that require media features to describe the concept.

The alternative solution to the problem is to develop a learning multimedia product that contains digestive system material in humans. This multimedia development is assumed to be able to support the teaching process and overcome the issues described above. The use of multimedia learning in delivering content has its own benefits and advantages, from several relevant studies the use of multimedia learning will make science learning more effective, making students more enthusiastic, especially can improve students' understanding of concepts, especially on the digestive system material in humans (Zhu, 2018)

The utilization of multimedia in education is beneficial for students and teachers, especially in the learning process or when delivering material. As explained by Munir (2015) that school requires multimedia technology because by using multimedia students can immediately see and hear the things being learned, students can also choose the material they like (Incedayi, 2018; Malik & Agarwal, 2012). Students' attention will also be more focused on learning and their curiosity will increase because the multimedia used attracts their attention. Babiker (2015) argues that using multimedia in teaching can benefit students by helping to meet the demands of information related to the material being studied. Multimedia also allows students to interact with information in different media. Kareem (2018) adds that multimedia is described as a system for conveying information that combines various types of communication such as text, video, audio, photos, sounds, animations, images and interactive content (Hat, Hamid, Sha'ari, & Zaid, 2017) which is then packaged using a computer. (Guan, Song, & Li, 2018)

The teacher also states that the learning resources needed to be developed and can be used as a source of independent learning for students are audiovisual learning media (Leow & Neo, 2014). Audio-visual material can only be meaningful if it is used as part of the teaching process. By using audio-visual media, students can utilize technology and media in a series of ways to enhance their learning as an alternative source for independent learning (Hapsari, Hanif, Gunarhadi, & Roemintoyo, 2019). Nevertheless, in the schools observed, both the teacher and other developers had never developed audio-visual media before. Therefore, it is necessary to create a media that can demonstrate learning materials (Shi, 2017), especially biology, that aims to facilitate students in understanding the concepts of learning material that are abstract or not directly observed.

From some of the above opinions, it can be concluded that educators must be able to create learning media that is tailored to the development of students. Learning activities are structured to generate active, independent, and systematic thinking skills. Students are in school to learn does not mean students do not have any knowledge, but students actually already have the experience to help them construct their knowledge at a later stage. Therefore, educators need to combine learning activities with various methods, media and use appropriate approaches to the stage of their development to be able to provide a deep understanding and develop their thinking skills. An audiovisual learning media, in this case, seems appropriate to bridge the potential issue.

Conclusion and Implication

The results of this study are: 1) the use of instructional media in science learning so far has not been executed optimally. The absence of interactive media to support learning is assumed as obstacles in the delivery of conceptual or abstract material. The teachers have access and knowledge to use multimedia but rare to use variation use of media especially on audio-visual. Even though it has potential, the teacher has not preferred to use audiovisual media. 2) The fifth-graders face a challenge since the students' lack of ability of cognitive visualization should face complex and conceptual material on the human digestive system. The teacher needs an audio-visual media that can help to visualize the digestive process. Students perceive audio-visual media as an acceptable solution. It also supported by the condition of the independence of teachers to collect and made the learning resources by themselves. The learning media needs to be developed in learning the subject of the digestive

system is in the form of media audiovisual by some consideration on the characteristic and essential need of students' level.

Based on the above conclusions, it is recommended to develop audio-visual media the subject of the human digestive system for fifth graders of elementary school. 1) For every elementary school teacher, it is hoped that later they can use a combination of appropriate didactic technic combined with interactive media rather than only use book and lecturing. Audio-visual-based or other media can support visualization of the subject of the human digestive system and similar conceptual material. Teachers are also expected to be able to develop themselves for several other media and materials. 2) For local government and school leaders, they are supposed to provide both moral and material support related to the use of interesting didactic technic and interactive audio-visual media through the provision of facilities and infrastructure in schools. It also will make improvements and understanding of its importance the use of media to teachers and create a sense of security and build motivation in learning for students.

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